

King Fahd University for Petroleum and Minerals

Calculus 4

Quiz2

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Q1) Determine whether the sequence converges or diverges .If it converges find the limit  $a_n = \frac{\sin 2n}{1 + \sqrt{n}}$

Q2) Determine whether the series converges or diverges .If it converges find the sum

$$\sum_{n=1}^{\infty} \left( e^{-n} + \frac{1}{n(n+1)} \right)$$

Q3) Determine whether the series converges or diverges.

a)  $1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \dots$

b)  $\sum_{n=1}^{\infty} \frac{1+4^n}{1+3^n}$

c)  $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^3+1}}$

Q4)a)find the partial sum  $S_2$  of the series  $\sum_{n=1}^{\infty} \frac{1}{n^4}$  . Estimate the error in using  $S_2$  as an approximation to the sum of the series

b)Give an improve estimate of the sum by using  $S_2$

c) Find a value of n so that  $S_n$  is within 0.00001 of the sum

Q5) Determine whether the series converges or diverges. If it converges how many terms of the series do we need to add in order to find the sum to 0.000001 accuracy?

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^6}$$